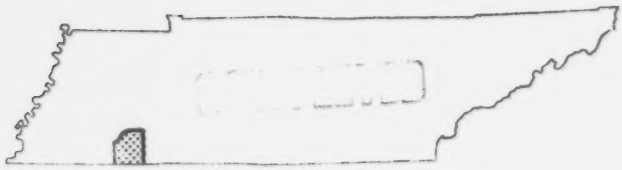
FLOOD INSURANCE STUDY

MCNAIRY COUNTY, TENNESSEE

UNINCORPORATED AREAS



APRIL 2, 1991

Federal Emergency Management Agency

COMMUNITY NUMBER -470127

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

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Flood Insurance Rate Map

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FLOOD INSURANCE STUDY

MCNAIRY COUNTY,
UNINCORPORATED AREAS,
TENNESSEE

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study revises and supersedes a previous Flood Insurance Rate Map for the Unincorporated Areas of McNairy County, Tennessee (Reference 1). This information will be used by the community to update existing floodplain regulations as part of the regular phase of the National Flood Insurance Program. The information will also be used by local and regional planners to further promote sound land use and floodplain development. Minimum floodplain management requirements for participation in the National Flood Insurance Program are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were performed by Allen & Hoshall, Inc. (the Study Contractor) for the Federal Emergency Management Agency (FEMA), under Contract No. EMW-88-C-2619. This study was completed in January 1989.

1.3 Coordination

On July 7, 1988 an initial coordination meeting was held with representatives of FEMA, the County of McNairy, and the Study Contractor. Coordination with town officials and Federal, State and regional agencies produced a variety of information pertaining to floodplain regulations, available community maps, flood history and other hydrologic data.

On May 8, 1990, the results of this Flood Insurance Study were reviewed and accepted at a final coordination meeting attended by representatives of the Study Contractor, FEMA, and the community.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the unincorporated areas of McNairy County, Tennessee. The area of study is shown on the Vicinity Map (Figure 1). The incorporated areas within the county were excluded from this study.

Flooding caused by overflow of Cypress Creek and Snake Creek was studied in detail.

Areas having low development potential or minimal flood hazards were previously studied using approximate analyses. The results were shown on the Flood Insurance Rate Map for the Unincorporated Areas of McNairy County, Tennessee (Reference 1) and are incorporated into this Flood Insurance Study.

The areas studied were selected with priority given to all known flood hazard areas and areas of projected development or proposed construction through January 1994. The scope and methods of study were proposed to and agreed upon by FEMA and McNairy County.

2.2 Community Description

McNairy County is in southwestern Tennessee. It is bordered by Chester County, Tennessee on the north; Hardeman County, Tennessee on the west; Hardin County, Tennessee on the east; and Alcorn County, Mississippi on the south. McNairy County is served by U.S. Routes 45 and 64, Illinois Central Railroad and Norfolk Southern Railway. The 1980 population of McNairy County was reported to be 22,525 (Reference 2).

Temperatures in McNairy County range from 37.5 degrees Fahrenheit (^{O}F) in January to 81.3^{O}F in August (Reference 3).

2.3 Principal Flood Problems

Seasonal rains result in periodic flooding in McNairy County, Tennessee. Flood problems arise from overflow into the relatively flat overbanks along Cypress and Snake Creeks. Development in the area has worsened the problems.

2.4 Flood Protection Measures

Flood protection measures are not known to exist within the study area.

FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

MCNAIRY COUNTY, TN
(UNINCORPORATED AREAS)

APPROXIMATE SCALE

16 0 16 32 48 MILES

VICINITY MAP

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that is expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1-percent chance of annual exceedence) in any 50-year period is approximately 40-percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60-percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each riverine flooding source studied in detail affecting the community.

Peak discharges for Cypress and Snake Creek were developed based on a regional flood-frequency report (Reference 4). The flood magnitude is a function of the drainage area and hydrologic location. Snake Creek in McNairy County is a partially gaged stream located in Hydrologic Area 2. The combined data of the regression equations and the station data were used to calculate discharges for this stream.

Cypress Creek in McNairy County is located entirely in Hydrologic Area 4. This also is a stream for which nearby gaging information is available.

Peak discharge-drainage area relationships for the 10-, 50-, 100-, and 500-year floods of each flooding source studied in detail in the community are shown in Table 1.

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ MILES)	PEAK DISCHARGE (CFS) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
CYPRESS CREEK					
at Falcon Road	60.2	5,796	8,254	9,328	11,600
at confluence of Turkey Creek	41.0	3,710	5,166	5,799	7,200
SNAKE CREEK					
at State Route 22	54.0	7,508	9,009	14,108	15,600
at confluence of Licks Creek	34.4	6,007	8,687	10,615	13,500
at Old Stage Road	18.8	3,751	6,362	7,529	10,100

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

Cross sections of the backwater analyses were obtained from field surveys. All bridges and culverts were field checked to obtain elevation data and structural geometry.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles and on the Flood Insurance Rate Map.

Roughness coefficient (Manning's "n") for the backwater analysis were assigned on the basis of field inspection of floodplain areas. Roughness coefficients ranged from 0.018 to 0.09 in the channel and 0.04 to 0.09 for the overbanks. Starting water-surface elevations were developed by the slope-area method. Flood profiles were computed using the HEC-2 step-backwater computer program (Reference 5).

The downstream area of Snake Creek near the county boundary was determined to be controlled by backwater from the Tennessee River. The 100-year flood elevation was taken from the Flood Insurance Study for Hardin County (Reference 6).

Flood profiles were drawn showing the computed water-surface elevations for floods of the selected recurrence intervals. In cases where the 50- and 100-year flood elevations are close together, due to limitations of the profile scale, only the 100-year profile has been shown.

The hydraulic analyses for this study are based on the effects of unobstructed flow. The flood elevations shown on the profiles

are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the map and described in the exhibit labeled Elevation Reference Marks.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program encourages state and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100- and 500-year floodplain boundaries and 100-year floodway to assist communities in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the 100-year and 500-year floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:24000 with a contour interval of 20 feet (Reference 7).

The 100- and 500-year floodplain boundaries are shown on the Flood Insurance Rate Map. On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A, AE, AH, AO, A99, V, and VE), and the 500-year floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 100- and 500-year floodplain boundaries are close together, only the 100-year floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 100-year floodplain boundary was delineated using the Flood Insurance Rate Map for McNairy County (Reference 1).

4.2 Floodways

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that

the 100-year flood can be carried without substantial increases in flood heights.

Floodways have not been shown or computed for this community. Along streams where floodways have not been computed, the community must ensure that the cumulative effect of development in the floodplain will not cause more than a 1.0-foot increase in the base flood elevations at any point within the community.

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 100-year floodplain, areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols the 100- and 500-year floodplains, the floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

7.0 OTHER STUDIES

The Flood Insurance Rate Maps printed for the Town of Selmer and the Town of Adamsville, Tennessee (References 8 and 9) agree with this study.

The Flood Insurance Studies in progress for Hardeman County, Tennessee and Alcorn County, Mississippi (References 10 and 11) agree with this study.

The revision in progress to the published Flood Insurance Study for Hardin County, Tennessee (Reference 6) agrees with this study.

This Flood Insurance Study supersedes the previously printed Flood Insurance Rate Map for McNairy County, Tennessee (Reference 1).

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting the Natural and Technological Hazards Division, FEMA, 1371 Peachtree Street, NE., Suite 736, Atlanta, Georgia 30309.

Future revisions may be made that do not result in the republishing of the Flood Insurance Study report. To ensure that any user is aware of all revisions, it is advisable to contact the map repository of flood hazard data located in the community.

9.0 REFERENCES AND BIBLIOGRAPHY

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2. U.S. Department of Commerce, Bureau of the Census, 1980 Census of Population, Number of Inhabitants, Tennessee, January 1982.

3. ----------, National Oceanic and Atmospheric Administration, Environmental Data Services, Climatological Data for Tennessee, Asheville, North Carolina, August 1988.

4. U.S. Geological Survey, Technique for Estimating Magnitude and Frequency of Floods in Tennessee, Randolph and Gamble, 1976.

5. U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profiles, Computer Program 723-X6-L202A, Davis, California, April 1984.

6. Federal Emergency Management Agency, Flood Insurance Study, Hardin County, Unincorporated Areas, Tennessee, September 1986, revision in progress.

7. U.S. Geological Survey, 7.5 Minute Series Topographic Maps, Scale 1:24000, Contour Interval 20 Feet: Purdy, Tennessee, 1949, photorevised 1972; Statonville, Tennessee, 1949, photorevised 1972.

8. Federal Emergency Management Agency, Flood Insurance Rate Map, Town of Selmer, McNairy County, Tennessee, June 1987.

9. ----------, Flood Insurance Rate Map, Town of Adamsville, McNairy County, Tennessee, September 1986.

10. ----------, Flood Insurance Study, Hardeman County, Unincorporated Areas, Tennessee, in progress.

11. ----------, Flood Insurance Study, Alcorn County, Unincorporated Areas, Mississippi, in progress.

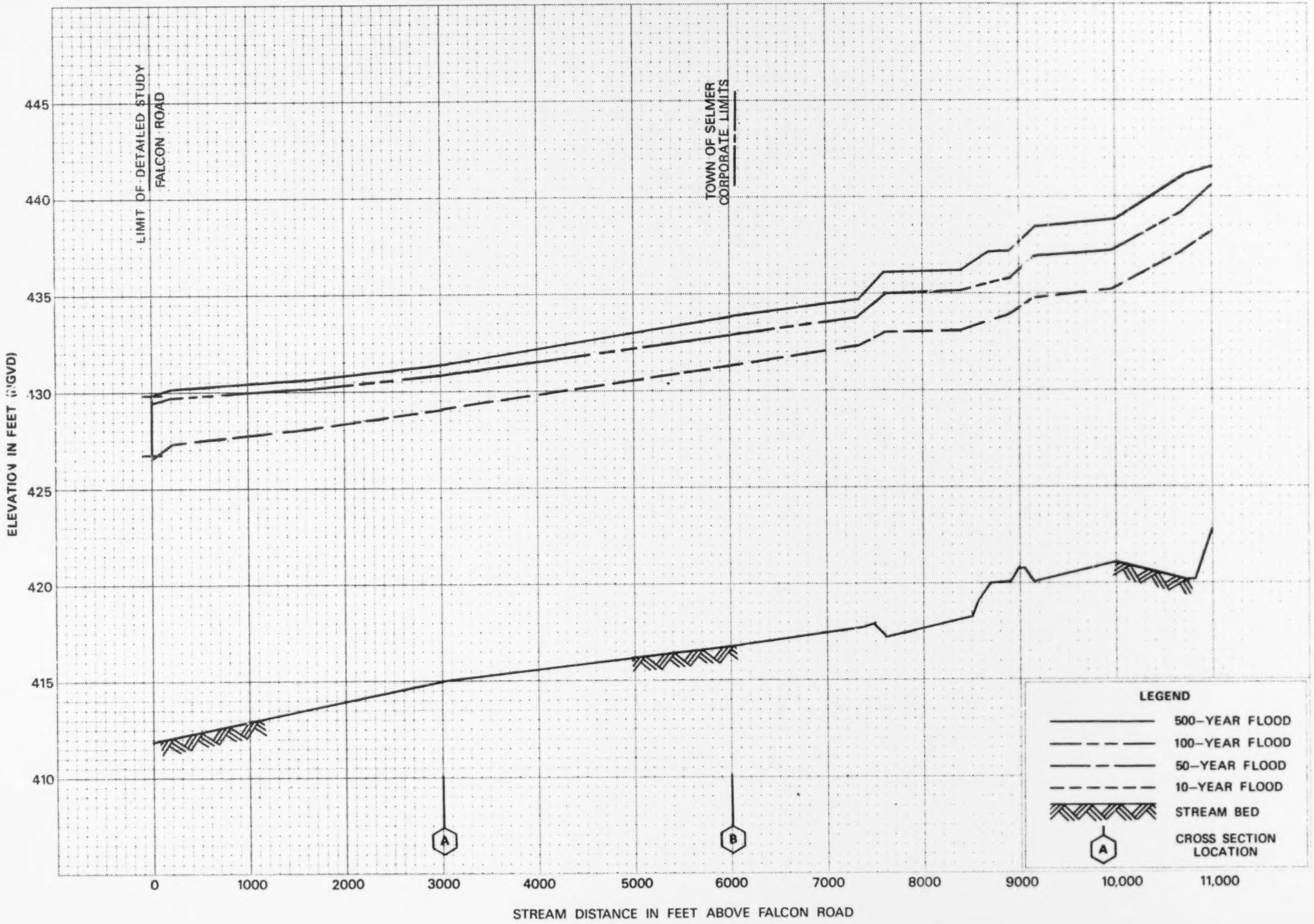
Federal Highway Administration, U.S. Department of Transportation, Design Charts for Open-Channel Flow, November 1977.

Seelye, Elvyn E., Data Book for Civil Engineers, Design, Volume One, Third Edition, 1960.

Utah State University, Department of Civil and Environmental Engineering, Computer-Assisted Flood Plain Hydrology and Hydraulics, Daniel Hoggan, McGraw-Hill Company, 1989.

ELEVATION REFERENCE MARKS

REFERENCE MARK	FLOOD INSURANCE RATE MAP PANEL	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1	0100	399.24	concrete curb on southwest corner of State Route 22 bridge over Snake Creek
2	0100	405.98	railroad spike in 30-inch oak located along U.S. Route 64 about 1.29 miles from bridge over Snake Creek
3	0100	408.06	PK nail in drive located at northeast corner of intersection of Leapwood Road and U.S. Route 64
4	0100	420.95	nail in power pole located at southwest corner of intersection of Leapwood Road and unnamed road
5	0100	416.87	concrete curb on southeast corner of Old Stage Road bridge over Lick Creek
6	0100	414.97	concrete curb on southeast corner of Old Stage Road bridge over Snake Creek
7	0100	415.04	PK nail in center of intersection of Old Stage Road and Leapwood Road
8	0075	442.61	top of bolt on northwest corner of hanging signal light pole on Falcon Road bridge over Cypress Creek



FLOOD PROFILES

CYPRESS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MCNAIRY COUNTY, TN
(UNINCORPORATED AREAS)

01P

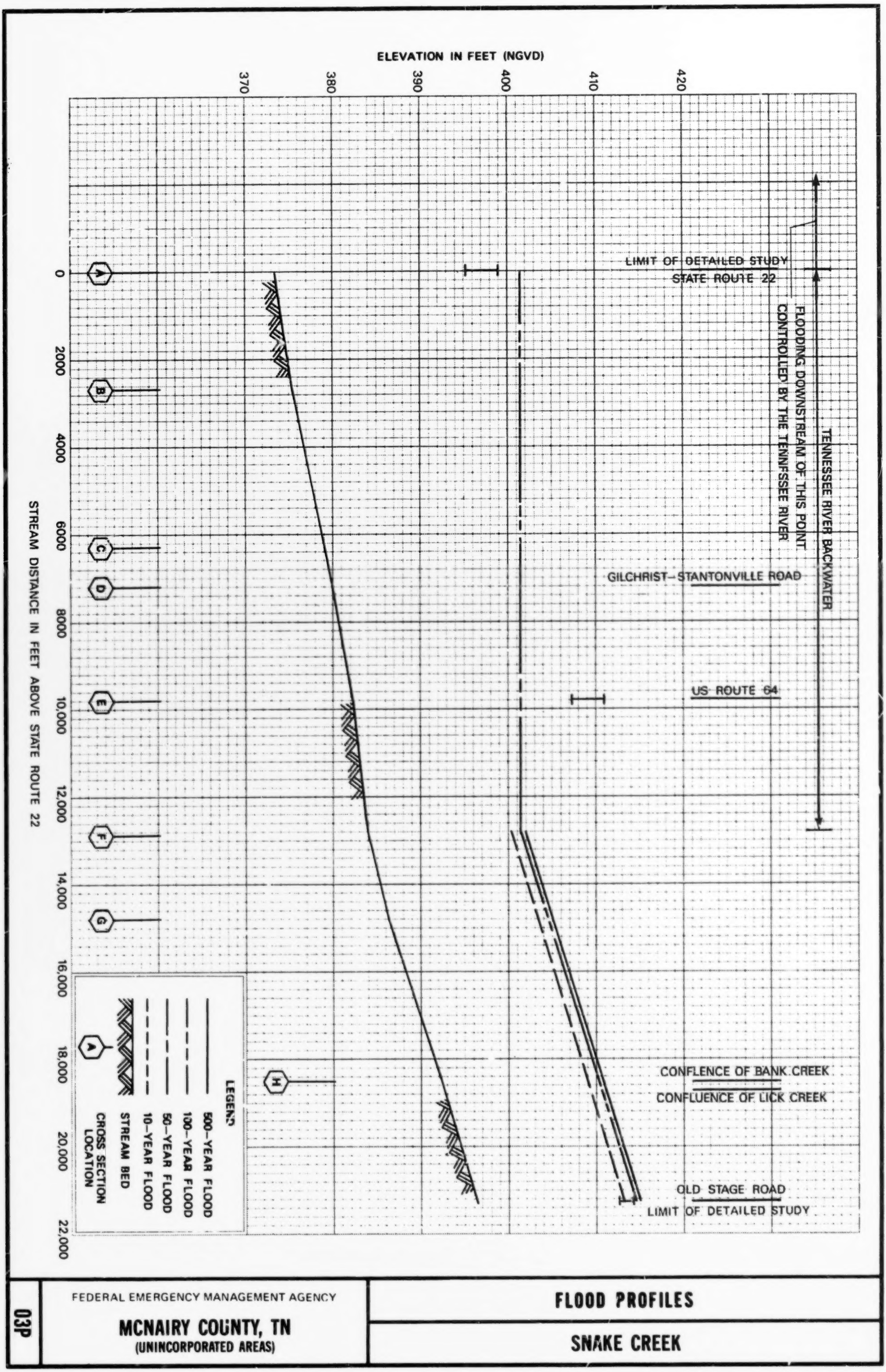
FLOOD PROFILES

CYPRESS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MCNAIRY COUNTY, TN
(UNINCORPORATED AREAS)

02P



FEDERAL EMERGENCY MANAGEMENT AGENCY

MCNAIRY COUNTY, TN
(UNINCORPORATED AREAS)

FLOOD PROFILES

SNAKE CREEK

03P

13